



GUIDELINES FOR THE DECOMMISSIONING (SHUTDOWN) OF MAJOR INDUSTRIAL SITES IN ONTARIO

JUNE 1984

KEO
717
A35
D42
1984
R0E



Ministry
of the
Environment

The Honourable
Andrew S. Brandt
Minister

Brock A. Smith
Deputy Minister

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact Service Ontario Publications at copyright@ontario.ca

KEO
717.A35
D 42
1984
C.2

GUIDELINES FOR DECOMMISSIONING (SHUTDOWN)
OF MAJOR INDUSTRIAL SITES IN ONTARIO

**HAZARDOUS CONTAMINANTS
AND STANDARDS BRANCH**
135 ST. CLAIR AVENUE WEST
TORONTO, ONTARIO M4V 1P5

June 1984

INTRODUCTION

This paper has been prepared to develop a set of guidelines which Ministry staff could use when dealing with the shutdown of an industry.

The prime concerns when dealing with the shutdown of an industry are:

1. To ensure that on-site contamination is identified; appropriate steps are taken to clean-up sites or steps taken to register the presence of contaminants on title so that unsuspecting future users of property will not be exposed to hazard or risk to health; and that safety of neighbouring citizens is not jeopardized by the presence of such contaminants or the movement of such contaminants off property.
2. Protection of the environment while the site is being shutdown and dismantled; and
3. To ensure that future uses are compatible with the previous use of the site.

As soon as the company decides on shutting down its operations, a detailed closure plan should be prepared by the company for review by the Ministry of the Environment. The scheduling of operations on the site must meet Ministry requirements. These requirements will depend on operations at the industry and will be determined on a case-by-case basis.

ENVIRONMENTAL CONSIDERATIONS

A) Background Knowledge of Plant Operations

Regional personnel should have an in-depth understanding of all operations of the industry on site. Where the land is slated for redevelopment, information on all previous uses of the site should be ascertained.

If sufficient knowledge of process operations, on-site treatment and disposal methods and location of underground storage tanks is not available, it will be necessary to conduct an engineering survey at the plant so that all operations are observed and pertinent information documented.

SEE APPENDIX II for examples of some of the effects and potential concerns associated with several process operations.

B) Shutdown Categories

A shutdown may fall into three categories, depending on the company's future plans and outlook. A shutdown may be:

- (i) temporary, with the chance of start-up in the near future (plant is mothballed);
- (ii) permanent, with no plans for operation in the foreseeable future (plant is mothballed); and

- (iii) permanent, with plans for the plant to be dismantled and the land redeveloped.

Closure Plan

A) General

Once the industry decides on the category of shutdown, a detailed closure plan should be developed by the company and reviewed by the Ministry of the Environment.

The closure plan may be dealt with in several phases:

1. PHASE I deals with the decommissioning of process operations and storage facilities.
2. PHASE II deals with the dismantling of the facilities. This will involve the decontamination and the transfer of equipment either to other sites or sold as scrap.
3. PHASE III involves preparation of the site for redevelopment of the land.

Timing for completion of each Phase of the shutdown is critical and must be included in the detailed close-out plan. Company and Ministry contacts should be established at the outset. See APPENDIX II for a type of shutdown schedule that may be developed.

Where bankruptcies are involved and the company has gone into receivership, it may be necessary to deal with the receivers for that company. Orders for remedial work may be required.

B) On-Site Waste Treatment Facilities

On-site wastewater treatment facilities and disposal areas must continue to operate during the shutdown. Existing waste treatment plants will handle process effluents and washwater from flushing out process units. Existing on-site facilities may also handle stormwater runoff until such a time as the rain water is of a quality suitable to be discharged directly to a water course.

Monitoring at waste treatment plants may have to be increased to ensure that batch discharges of high strength wastes, which will result during the clean-up, are properly treated. High strength wastes discharged from these facilities may result in an upset at the municipal sewage works.

When a treatment facility is not capable of producing an acceptable effluent for discharge to a watercourse, arrangements will have to be made with local municipalities to get the pre-treated effluent into the sanitary sewer. The industry would be responsible for making such arrangements with the local municipality. The Ministry of the Environment would only act as a liaison in these matters. If other arrangements have to be made for the disposal of wastes, they will require Ministry approval for the collection, transportation and treatment or disposal of such wastes.

In cases where the shutdown is only temporary or where certain facilities (boiler house, etc.) are retained in a permanent shutdown, all Certificates of Approval and permits would remain in force if there were no alterations. Consultation with the Ministry's Industrial Approvals Section may be required regarding specific problems and/or certain conditions that have been written into existing Certificates of Approval.

All areas that have been used for the storage or treatment of chemicals must be identified and documented. Where need be, information regarding past uses should also be documented. Soil analysis is required in these areas to determine the level or absence of contamination.

In cases where the shutdown operation produces solid wastes in excess of the capacity of on-site facilities, arrangements meeting Ministry requirements will have to be made by the company.

In time, the existing waste treatment and disposal facilities will have to comply with the closure procedures and other Ministry policies where they apply.

C) Hydrogeological and Soil Investigation

To ensure that industrial sites and adjoining properties are environmentally safe following the shutdown, a detailed hydrogeological and soil investigation may be required. The need will depend on each case and will be determined on a case-by-case basis.

Hydrogeological studies should cover, but not be limited to, the following items:

- (i) accurately define direction(s) and rate of groundwater flow under the site;
- (ii) determine the background groundwater quality upgradient of the processing and storage facilities;
- (iii) determine whether there has been contamination from within the plant or other site operations by monitoring the quality of the groundwater;

- (iv) conduct a soil sampling program in areas that were used for bulk storage of chemicals, landfill, tank farms or any other identified areas to determine if seepage of contaminants into the soil has occurred; the level of contamination and the extent of any migration in these areas; and
- (v) identify the levels of combustible gases (methane) in the soil gas across the site.

The extent of hydrogeological studies will depend on the environmental concerns of each situation.

Where groundwater is found to be contaminated, remedial measures will have to be taken. The industry will have to design a leachate containment and/or collection system that would identify the following:

- (i) proposed location of leachate containment and/or collection system with respect to site property boundaries;
- (ii) approximate length of such a system;
- (iii) depth that such a system would have to be constructed below surface;
- (iv) the type and nature of material of the collection system, the proposed method of transporting any collected leachate from the leachate collection system to a treatment facility either on or off-site;
- (v) the estimated volumes of leachate to be collected (based on rate of groundwater flow);
- (vi) the suitability of an on or off-site leachate treatment facility to adequately handle the volumes of leachate collected; and
- (vii) the location and design of any pumping facility, if required.

Where the level of chemical substances in soil exceeds the Ministry's Phytotoxicological guidelines for urban soils, the contaminated ground must be removed and disposed of properly.

The above work may be required of industry through Sections 6, 12 and 16 of the Environmental Protection Act and Sections 15, 16 and 18 of the Ontario Water Resources Act.

D) Disposal of Materials Accumulated on Site

- (i) Raw materials may be sold to another industry or returned to the supplier. Where industry is unable to dispose of raw materials, these products may have to be designated

and handled as a waste. In a special case, the industry may want to leave raw materials on site to be sold as part of the assets. Under these circumstances, a security (bond) would be required to protect the material and the environment;

- (ii) products shipped out to market;
- (iii) inert materials may be left on site; and
- (iv) waste materials, which may include tank bottoms, residues from process units and contaminated soils, will have to be collected, stored and disposed of off site. Wastes may only be disposed of on site if the site is licensed for the disposal of such wastes. Perpetual care provisions for the maintenance of such sites must be approved by the Ministry and the site must be registered on the property title.

Any wastes classified as hazardous wastes (PCB's, radioactive, etc.) must conform to all requirements for disposal of such wastes. Where PCB wastes are involved, the company should be required to remove the material to an approved facility (i.e. Kinetic Ecological Resource Group Limited).

Waste effluent from flushing out process units can be treated on-site or stored for off-site disposal.

If the industrial site is to be redeveloped, all disposal sites, storage pits or any products in the sub-soil must be removed and disposed of off site. When all process units have been removed, contaminated soil due to undetected leaks must also be removed and disposed of off site. The redevelopment of sites where wastes are involved must be in accordance with Section 40 of the Environmental Protection Act. The Minister's approval must be obtained for the reuse of the land which has been used for the disposal of wastes within a period of twenty-five years from the year in which such land ceased to be so used.

E) On-Site Supervision

During Phase II of the shutdown, Ministry staff will have to inspect the site periodically to ensure that all dismantling is being done in accordance with Ministry requirements. In some cases, qualified supervisory staff may have to be provided by the company to ensure that the different demolition contractors are aware of the Ministry's requirements.

Liaison with the Ministry of Labour and the Fuels Safety Branch, concerning airborne dust (asbestos) and petroleum tanks, must be maintained during the demolition phase of the shutdown. In addition, other agencies, such as the Atomic Energy Control Board and the Explosives Branch of Energy, Mines & Resources Canada, may also be involved, depending on the situation.

F) Air Quality

Asbestos may be present as building or pipe insulation. The removal of asbestos should be carried out in accordance with Regulation 309 as amended.

Extreme care should be taken in cleaning out storage bins. As some of the material in storage may be classified as hazardous, re-entrainment of dust may be detrimental both to the workers and the environment.

Control of dust and odours during the shutdown or dismantling operations should conform to Ministry requirements. It may be necessary to have the company set up monitors to ensure adequate protection to the surrounding neighbourhood.

G) Land Usage





When the site is environmentally secure (with respect to groundwater and soils contamination, waste removal, etc.) it should meet the requirements for other uses within the extent of the current zoning.

When the site is sold for redevelopment, a clause should be written into the purchase agreement that the purchaser (new owner) accepts full responsibility for any outstanding environmental problems and agrees to comply with any outstanding directions or control orders that may still be in effect on the site. In some cases, a warning in the form of a restriction on the use of the land may be required. Such a document could be registered on the title of the property and would serve as a notification to the prospective purchaser of an existing environmental concern on the site.

APPENDIX I

<u>PROCESS</u>	<u>EFFECT</u>	<u>CONCERN</u>
A) Material Storage	<ul style="list-style-type: none">- chemical residues- leachate	<ul style="list-style-type: none">- safety and health hazard- groundwater and soil contamination
B) Mining (tailings disposal)	<ul style="list-style-type: none">- solids residual- leachate	<ul style="list-style-type: none">- safety hazard- surface and groundwater quality
C) Sand and gravel pits	<ul style="list-style-type: none">- water table levels	<ul style="list-style-type: none">- safety- contamination of ground and/or surface waters
D) Tanneries, Metal Industries, Refineries		
(i) on-site solid and liquid waste disposal	<ul style="list-style-type: none">- methane gas and leachate from on-site disposal and storage	<ul style="list-style-type: none">- safety and health hazards, soils contamination, groundwater and surface water quality
(ii) underground storage	<ul style="list-style-type: none">- leachate- structure	<ul style="list-style-type: none">- groundwater quality, soils contamination- public safety

APPENDIX II
SHUTDOWN SCHEDULE

FIRST QUARTER (JAN. - MARCH)	SECOND QUARTER (APRIL - JUNE)	THIRD QUARTER (JULY - SEPT.)	FOURTH QUARTER (OCT. - DEC.)	
NORMAL	OPERATIONS			
				
		DECOMMISSIONING		
				
PRODUCT	SHIPPING			
				
			DISMANTLING	
				
				LAND REUSE
